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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,470	03/29/2001	Yoshihiro Yoneda	82-01	5656

7590 03/27/2002

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 03/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/820,470

Applicant(s)

YONEDA, YOSHIHIRO

Examiner

Ishwar B Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 5, 6, 25-39 and 47-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-24 and 40-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1-4, 7-24 and 40-46 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the examiner had not demonstrated that examining all the claims together would impose an undue burden on the examiner. This is not found persuasive because mutually exclusive embodiments comprising the species add additional burden.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to because figures are improperly cross hatched. All of the parts shown in section, and only those parts, must be cross hatched. The cross hatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Figure 13, 14, 15 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid

abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: (a). "24a" should be - - 12a - -, page 1, line 32. (b). "24b" should be - - 12b - -, page 1, line 33. (c). "shirt-circuit" should be - - short-circuit - -, page 3, line 8.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 9 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what is meant by "spacing distance". Is it same as pitch, distance between the terminal? Art has not been applied to the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1-4, 7-8, 40-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Echigo et al., US Patent 6,274,821, hereafter Echigo.

Regarding claims 1 and 40, Echigo discloses a surface-mounting substrate for mounting a part thereon, which comprises a core substrate, a plurality of layers of patterned wiring lines, which are separated from each other by an insulation layer interposed there between, vias piercing through the insulation layer to connect the wiring lines at the adjacent layers to each other (core substrate 1, insulation layer L1, L2, L3, pattern 11, via 7 see figure 1, column 3, line 5-50),

and a layer of connecting terminals to mount a part on the surface-mounting substrate, each of the connecting terminals connecting with the wiring line at the outermost layer of wiring lines, wherein the connecting terminal is filled in an outermost insulation layer provided at the surface of the surface-mounting substrate, and has a surface exposed at substantially the same level as the level of the surface of the

outermost insulation layer (top connecting terminal 11 into the top resist layer L1R, see figure 1, column 3, line 40-50).

Regarding claim 2 and 3, Echigo further discloses electrode 10, which is soldered to the terminal (see figure 1).

Regarding claim 4 and 41, Echigo further discloses semiconductor device 8, (see figure 1).

Regarding claim 7 and 8, Echigo further discloses solder resist layer 13, (see figure 1).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 10-24 and 42-46 rejected under 35 U.S.C. 103(a) as being unpatentable over Echigo et al., US Patent 6,274,821, hereafter Echigo, as applied to claim 1 above.

Regarding claims 10, 12, 15, 42, 44 and 46, the applicant is claiming the arrangement of the terminal, the wiring lines on top surface and below the top surface and their uniform distribution. Though Echigo does not explicitly disclose the uniform

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density of the terminal and internal wiring pattern, the terminals on the top surface will depend upon the number of electrodes on semiconductor device to be connected and the arrangement and routing of the wiring pattern will be arranged to get maximum possible component density of the component mounting pad without compromising the quality of the board, such as withstanding the thermal expansion contraction without warping or crack, better heat dissipation rate, rigidity, avoiding short circuiting etc.

^{KC}
3/23/02 And, it is a matter of common sense to have uniform distribution of the features in order to have the above advantages. Therefore, it would have been obvious to one having ordinary skill in the art the time the invention was made to provide the circuit board of Echigo with terminal arrangement and wiring arrangement uniformly distributed in order to get higher component density without compromising the quality and improving the reliability.

Regarding claim 11, 13, 43 and 45, Echigo further discloses the conductive member includes the terminals, wiring lines, and vias and power or ground planes, see figure 1.

Regarding claim 14 and 18, though Echigo does not explicitly disclose a power or ground layer, it is inherent to use a layer as power layer for distributing the power or a ground layer for providing grounding or shielding in the circuit assembly and further meshed power / ground layers are known in the art. Therefore, it would have been obvious to one having ordinary skill in the art the time the invention was made to

provide the circuit board of Echigo with a power layer and/or ground layer in order to distributing the power required or to provide grounding or shielding for safety.

11. Claims 16,17 rejected under 35 U.S.C. 103(a) as being unpatentable over Echigo et al., US Patent 6,274,821, hereafter Echigo as applied to claim 1 above, and further in view of Hsu et al. US Patent No. 6,242,815, hereafter Hsu.

Echigo does not disclose the dummy member, however, dummy pad or dummy wiring in known in the art either for maintaining the uniformity of member or increasing strength or rigidity of the board or for allowing the changes in future. Hsu discloses dummy pads for increasing the rigidity and the strength of the mount area. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Echigo with dummy member as taught by Hsu to maintain the rigidity and strength and the resultant reliable and long service life.

12. Claims 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Echigo et al., US Patent 6,274,821, hereafter Echigo as applied to claim 1 above, and further in view of Takubo et al., US Patent 6,329,610, hereafter Takubo, Noda et al., US Patent 5,841,190, hereafter Noda and Yoshikawa et al., US Patent 5,796,165, hereafter Yoshikawa.

Regarding claims 19-24, the applicant is claiming various width and spacing of terminals, wiring and the via. Though, Echigo does not explicitly disclose such width and spacing of the terminals, wiring and via, the features as claimed are known in the art

and will depend upon the type of the material used, current carrying capacity, manufacturing process and space available for a specific requirement. Noda and Takubo disclose via with a diameter of 50 μm and Yoshikawa discloses wiring with 200 μm width. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Echigo with the via dimension and wiring width as taught by Takubo, Noda and Yoshikawa in order to meet the specific requirement such as component density, signal transmission capacity and the resultant reliable circuit board.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Arima, Tsukada et al., Ohshima et al, Nakayama et al., Iijima et al., Ryu, Tanahashi, Ito disclose the circuit board similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar B Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 308 9883. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
March 20, 2002


Kuenes
Primary Examiner